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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,699	02/22/2002	Mitsutoshi Nakamura	15162/04300	1268

24367 7590 09/20/2005

SIDLEY AUSTIN BROWN & WOOD LLP  
717 NORTH HARWOOD  
SUITE 3400  
DALLAS, TX 75201

EXAMINER

DI GRAZIO, JEANNE A

ART UNIT PAPER NUMBER

2871

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/081,699

Applicant(s)

NAKAMURA, MITSUTOSHI

Examiner

Jeanne A. Di Grazio

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on RCE June 23, 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.  
4a) Of the above claim(s) 3 and 10-21 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1, 2, 4-9, 22 and 23 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### *Claims*

Claims 1, 2, 4-9, 22 and 23 are pending per RCE Request and Amendment of June 23, 2005 with claims 22 and 23 having been newly added per said Amendment.

Claims 3 and 10-21 have been previously withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on December 28, 2004.

### *Continued Examination Under 37 CFR 1.114*

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 23, 2005 has been entered.

### *Claim Objections*

Claim 22 (new) is objected to because of the following informalities:

As to claim 22, the expression “abruptly heating” is objected to as unclear. ‘Abrupt’ means unexpected or lacking in smooth continuity. See Merriam Webster’s Collegiate Dictionary 10<sup>Th</sup> Ed. at page 4 (defining “abrupt”). Furthermore, it appears to the Examiner that said expression is not common jargon in the art of reversible recording media.

Thus, to say that something is abruptly heated suggests that the heating is unexpected or discontinuous.

For examination purposes, the Examiner interprets “abruptly heating” to generally mean heating by absorption of light.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-9, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application No. 2000-225772A (Aug. 15, 2000)(to Matsuda et al.) in view of United States Patent 6,524,759 B1 (to Sugimoto et al.).

As to claim 1 (amended), Matsuda teaches and discloses a reversible recording medium having a cholesteric liquid crystal heat-sensitive recording layer and associated method (Title, entire application). The medium forms 'good and uniform recording images.' (Id.).

The application teaches "forming a white state by raising all or some areas of a heat-sensitive recording material to the temperature of isotropic phases" (Abstract)(Applicant's "a first heating process for heating the liquid crystal in a crystal phase to a first temperature that allows the liquid crystal to exhibit a cholesteric liquid crystal phase or an isotropic phase to form an image"), cooling the material for a cholesteric reflective color and then quenching the material in order to fix the color and then heating it again in order to crystallize part of it (Id.)(Applicant's "a second heating process for heating at least a part of the recording medium containing at least a part of an area to a second temperature, wherein said second temperature allows the area where the image has been formed by the first heating process to discolor or develop color without external pressure.").

Please note that Matsuda teaches multiple steps of heating, cooling and fixing of images.

Matsuda does not appear to explicitly specify that the second temperature causes the at least part of an area to exhibit a cholesteric fixed phase after cooling.

Sugimoto is drawn to a reversible recording medium, method and apparatus for same in which it is known that in order to fix a transparent state of a recording layer, the layer is fixed by rapid cooling which erases the recorded image. Therefore, reversible recording is carried out (See Column 1, Lines 50-60).

It would have been obvious to one of ordinary skill in the art of liquid crystals and reversible recording media to modify Matsuda in view of Sugimoto to erase a recorded image.

As to claim 2, Applicant's method steps being the same as those of Matsuda, it may be presumed that the image is a visible image.

As to claim 4, Matsuda teaches the step of cooling after the first heating as noted. Sugimoto also teaches rapid cooling as noted.

As to claims 5-9, Matsuda includes the step of cooling. Matsuda may not appear to explicitly disclose that upon rapid cooling the liquid crystal exhibits a glass phase, a first heating to exhibit a glass phase, and specificities of the first and second temperatures.

However, as previously noted in the prior Office Action and per Applicant's Response to Election of Species in Paper of December 30, 2003, "it is respectfully asserted that one skilled in the art would appreciate that a heating process can include steps of heating and cooling." (Pages 3 and 4)(Remarks, December 30, 2003).

Therefore, in view of Applicant's Remarks and Matsuda, it would have been obvious to one of ordinary skill in the art of liquid crystals and recording media at the time the invention was made to include rapid cooling of the liquid crystal to exhibit a glass phase, a first heating to exhibit a glass phase, and specificities of the first and second temperatures as within the realm of knowledge of one skilled in the art as part of a heating process.

As to claim 23 (new), Matsuda teaches and discloses a reversible recording medium having a cholesteric liquid crystal heat-sensitive recording layer and associated method (Title, entire application). The medium forms 'good and uniform recording images.' (Id.).

The application teaches "forming a white state by raising all or some areas of a heat-sensitive recording material to the temperature of isotropic phases" (Abstract)(Applicant's "a first heating process for heating the liquid crystal in a crystal phase to a first temperature that

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allows the liquid crystal to exhibit a cholesteric liquid crystal phase or an isotropic phase to form an image”), cooling the material for a cholesteric reflective color and then quenching the material in order to fix the color and then heating it again in order to crystallize part of it (Id.)(Applicant’s “a second heating process for heating at least a part of the recording medium containing at least a part of an area to a second temperature, wherein said second temperature allows the area where the image has been formed by the first heating process to discolor or develop color without external pressure.”).

Please note that Matsuda teaches multiple steps of heating, cooling and fixing of images.

Matsuda does not appear to explicitly specify a cooling process for cooling at least part of the area to fix the image after the second heating process thereby causing the at least part of an area subject to the second heating process to exhibit a cholesteric fixed phase having a selective reflection property.

Sugimoto is drawn to a reversible recording medium, method and apparatus for same in which selective reflection is used for black and white color and high contrast (Column 3, Lines 35-55).

It would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Matsuda in view of Sugimoto for black and white color and high contrast.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Application No. 2000-225772A (Aug. 15, 2000)(to Matsuda et al.) in view of Japanese Patent Application No. 2001-228453 (to Sugimoto et al.).

As to claim 22 (new), Matsuda teaches and discloses a reversible recording medium having a cholesteric liquid crystal heat-sensitive recording layer and associated method (Title, entire application). The medium forms 'good and uniform recording images.' (Id.).

The application teaches "forming a white state by raising all or some areas of a heat-sensitive recording material to the temperature of isotropic phases" (Abstract)(Applicant's "a first heating process for heating the liquid crystal in a crystal phase to a first temperature that allows the liquid crystal to exhibit a cholesteric liquid crystal phase or an isotropic phase to form an image"), cooling the material for a cholesteric reflective color and then quenching the material in order to fix the color and then heating it again in order to crystallize part of it (Id.)(Applicant's "a second heating process for heating at least a part of the recording medium containing at least a part of an area to a second temperature, wherein said second temperature allows the area where the image has been formed by the first heating process to discolor or develop color without external pressure.").

Please note that Matsuda teaches multiple steps of heating, cooling and fixing of images.

Matsuda does not appear to explicitly specify a second heating process for abruptly heating at least a part of an area of the recording medium to a second temperature causing the liquid crystal to transit to a cholesteric liquid phase before the liquid crystal transitions to a crystal phase.

Sugimoto teaches an optical recording medium for multicolor recording and optical recording device and teaches a thermo-optical conversion layer which absorbs light and generates heat (Abstract, entire application).



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It would have been obvious to one of ordinary skill in the art of recording media and liquid crystals at the time the invention was made to modify Matsuda in view of Sugimoto for multicolor display.

***Response to Arguments***

Applicant's arguments with respect to said claims have been considered but are moot in view of the new ground(s) of rejection.

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*Conclusion*

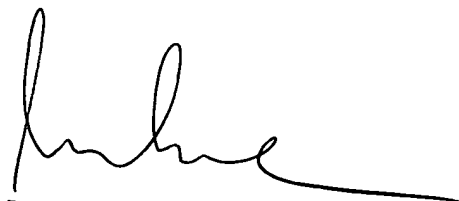
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571) 272-2289. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio  
Patent Examiner  
Art Unit 2871

JDG



DUNG T. NGUYEN  
PRIMARY EXAMINER